

11/8/16

ARIZONA HOUSE OF REPRESENTATIVES
Fifty-second Legislature – Second Regular Session

**COMMITTEE ON HOUSE AD HOC COMMITTEE ON TREATMENT OF
TRAUMATIC BRAIN INJURIES**

Report of House Ad Hoc Committee of Traumatic Brain Injuries Meeting
Thursday, November 3rd, 2016
House Hearing Room HHR5 -- 10:00 AM

Convened 10:02 AM

Recessed

Reconvened

Adjourned 11:27 AM

Members Present

Mr. Saad Allawi
Dr. Levi Bolton
Ms. Kara Kalkbrenner
Representative Jay Lawrence
Representative Eric Meyer
Representative Mark Finchem, Chairman

Members Absent

Dr. George Hishaw
Dr. Gary Smith

Agenda

Original Agenda – Attachment 1

Request to Speak

Report – Attachment 2

Presentations

| <u>Name</u> | <u>Organization</u> | <u>Attachments (Handouts)</u> |
|----------------------|-------------------------------------|--------------------------------------|
| Saad Allawi | Independent | 3 |
| Dr. Carol Hendricks | North Star Hyperbaric Neurology, PC | 4 |
| Committee Attendance | | 5 |

R. Padilla

Renee Padilla, Chairman Assistant
November 8th, 2016

(Original attachments on file in the Office of the Chief Clerk; video archives available at <http://www.azleg.gov>)

10:02AM CONVENED
11:27A ADJOURNED

REVISED - 11/01/16

REVISED - 11/01/16

REVISED - 11/01/16

Interim agendas can be obtained via the Internet at <http://www.azleg.state.az.us/InterimCommittees.asp>

ARIZONA HOUSE OF REPRESENTATIVES

INTERIM MEETING NOTICE OPEN TO THE PUBLIC

HOUSE AD HOC COMMITTEE ON TREATMENT OF TRAUMATIC BRAIN INJURIES

Date: Thursday, November 3, 2016

Time: 10:00 A.M.

Place: HHR 5

AGENDA

1. Call to Order
2. Introduction of Members
- 3. Review of Committee Charge
4. Presentations:
 - Traumatic Brain Injury, Dr. Carol Hendricks
 - Hyperbaric Oxygen Therapy, Dr. Carol Hendricks
 - Utilization of Current Resources, Saad Allawi
5. Committee Discussion
6. Public Comment
7. Adjourn

Members:

Representative Mark Finchem, Chairman
Representative Jay Lawrence
Representative Eric Meyer
Saad Allawi

Dr. Levi Bolton
Dr. Georg Hishaw
Chief Kara Kalkbrenner
Dr. Gary A. Smith

11/1/16
JY

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PLEASE COMPLETE THIS FORM FOR THE PUBLIC RECORD



HOUSE OF REPRESENTATIVES

Please PRINT Clearly

Committee on Treatment of Traumatic Brain Injuries Bill Number

Date 11/3/2016 ☐ Support ☐ Oppose ☐ Neutral

Name ROBIN W. O'BANION Need to Speak? ☒ Yes ☐ No

Representing Self Are you a registered lobbyist?

Complete Address 844 E INDIAN WELLS PLACE CHANDLER 85249

E-mail Address _____ Phone Number _____

Comments: _____

*****FIVE-MINUTE SPEAKING LIMIT*****

Attachment 2

HBOT for Veterans with TBI

Presentation to the State of Arizona

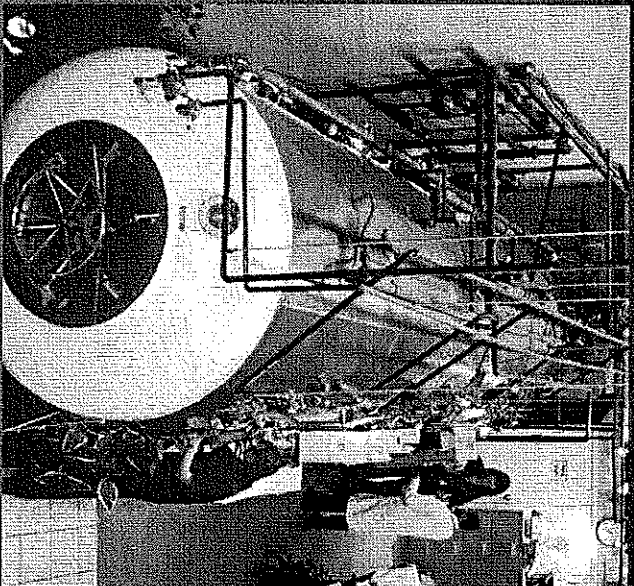
Updated from the November 2015 presentation to the PTSD committee

Contents

- I. Hyperbaric Oxygen Therapy Treatment (HBO^T)
- II. Applications in the US and Worldwide
- III. Outcomes for TBI
- IV. Costs of treatment
- V. Options in AZ
- VI. Oklahoma experience to-date
- VII. Next steps

I. HBOT – What is it

- Pure Oxygen supplied at 1.3 to 2.2 atmospheres
- Each session is one hour
- Typical treatment for TBI/PTSD is 4 to 10 weeks (40 to 100 sessions/dives)

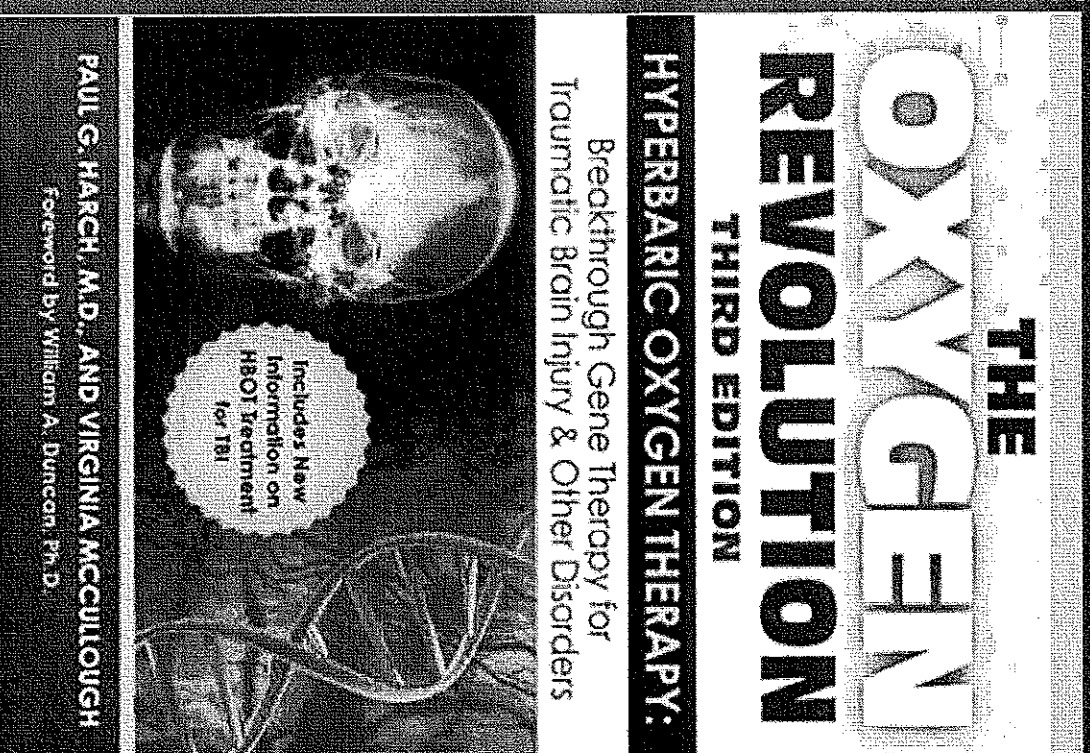


I. HBOT – How it works

- Activates 8,101 genes
- Restarts stunned cellular metabolism
- Restarts stunned mitochondria
- Activates stem cells – 8X normal

HBOT is gene therapy with proven physiological benefits

I. HBOT – Dr. Harch pioneer



II. Applications – US currently

Applications:

- 13 indications in the US – *insurance/government pay*, e.g.
 - Wounds resulting from Diabetes
 - Carbon Monoxide poisoning
- TBI from sports injuries – *private pay*

In use for TBI since 1963

HBOT for TBI is “off label”, not experimental treatment

II. Applications – States

Oklahoma – funded a Patriot Clinic in 2014

Other States evaluating legislation

TX, UT, CO, ID, MT, IN, CT, VA, NC, LA, TN,
NY, FL

States taking the lead – “bottom-up”

II. Applications - International

Applications, e.g. ;

- PTSD
- Stroke and heart attack
- Hyperbaric ambulance
- TPA/clot buster
- Spinal cord injuries
- Delivery
- Pre - operative

Many indications by other countries

II. Applications – Other countries

Countries – Highlights:

- Russia – physician driven, no limit
- UK, France, Germany – many indications
- Japan – Stroke and Heart attack ambulances
- Israel – Standard operating practice for TBI for veterans
- Australia – Spinal injuries
- China – 50 indications

US is lagging behind

II. Applications – U.S. trying to catch up

Research in HBOT – Examples

- U. of Houston
- U. of South Florida in Tampa
- U. of Utah – LDS Hospital
- U. of Colorado – Denver (animal work)
- U. of Minnesota – Hennepin County MC
- Ohio State University
- Loma Linda U.
- U. of Pennsylvania
- North Carolina U.
- South Carolina U.
- Center for Autism Research

III. Outcomes – Results*

Objective Measures

- 15 point increase in IQ
- 30% reduction in PTSD
- 39% reduction in Post-Concussion Syndrome
- 51% decrease in depression
- 64% reduction in the need for psychoactive or narcotic medication
- 100% improvement in neuropsychological - 6 months post treatment
- 39% improvement in cognitive, 45% physical and 96% emotional
- Over 50% return to work (40 sessions) and 80% (80 sessions)

Subjective Measures

Patient and families interviewed – many videos and cases illustrating very positive levels of satisfaction

HBOT works

*IHMF NBIRR – 01 study results (LSU, OSUCHS, OUHC)

III. Outcomes – Results in Israel

Israeli study

| Category | Baseline | HBOT |
|------------------------------|----------|-------|
| Memory | 82.43 | 96.54 |
| Executive function | 88.26 | 96.96 |
| Attention | 85.13 | 95.30 |
| Information processing speed | 85.12 | 95.04 |

US Veterans going to Israel for treatment

III. Outcomes – Veteran's perspective

“..... But nothing comes close to seeing your wife, a full year after you have returned from war, look at you with tears in her eyes and tell you, “It’s good to have you back.” The entirety of this transformative experience is one that mere words can hardly convey. Hyperbaric oxygen therapy has restored me as a person, as a husband, as a soldier, and as a leader.....”

*Captain Matthew Smothermon,
December 2014*

III. Outcomes – Athletes use it

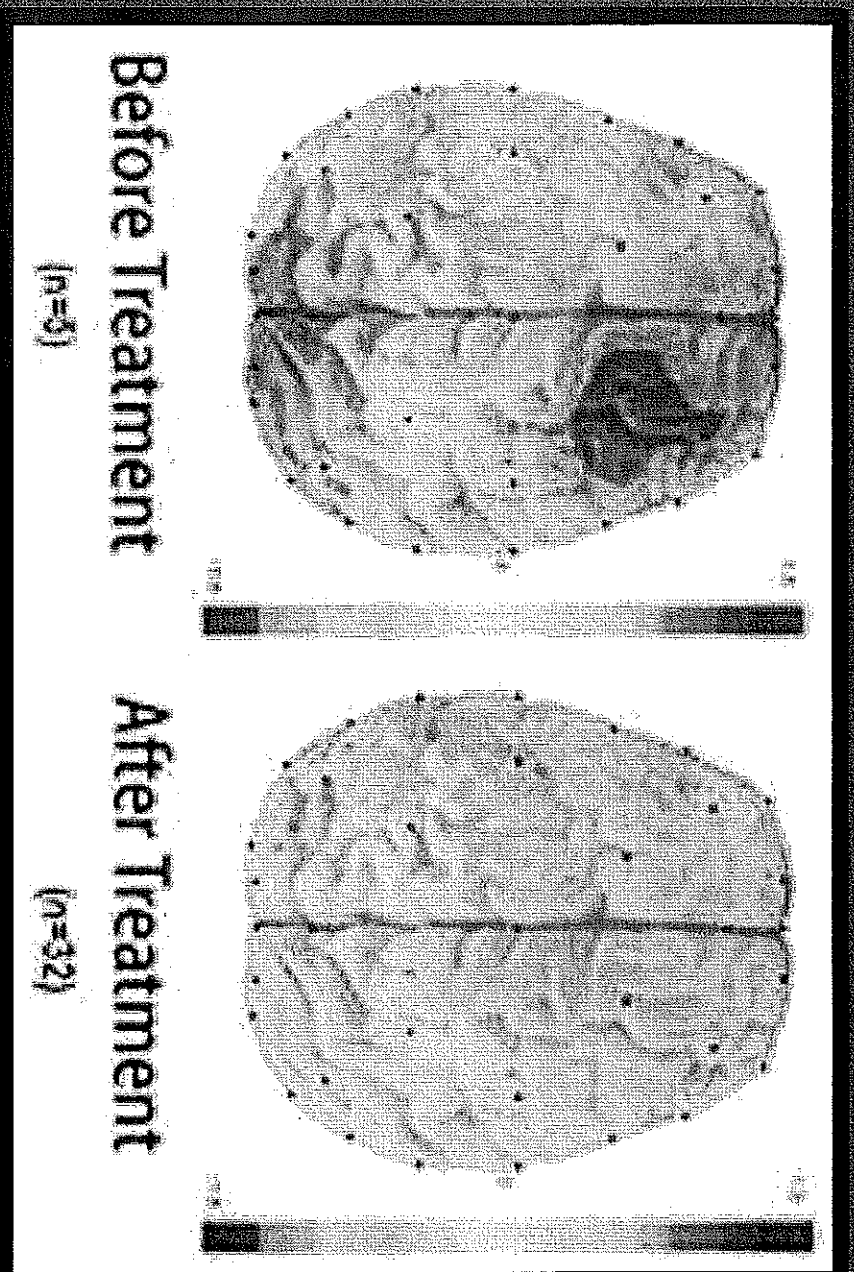
Athletes treatment

- At least 300 athletes have home HBOT single “pods”
- Many others use public facilities
- Use for TBI and other neurological issues
- Many high profile individuals e.g. *Joe Namath, Lance Armstrong, Evander Holyfield, Ken Griffey, Brett Favre, Michael Vick, Michael Phelps*

It has worked for athletes

III. Outcomes – Scan proof

Pre and Post HBOT scans



III. Outcomes – Compared to other treatments

Reduction in PTSD*

HBOT (LSU pilot)
30%

Treatment

- Cognitive Processing Therapy 14%
- Trauma Focused Group Treatment – 2.2%
- Prolonged Exposure Therapy 28%
- Transcendental Meditation 21%
- Virtual Reality Exposure Therapy – 23%

Symptom Management

* LSU study

IV. Costs – Traditional treatment *direct costs*

Direct Costs*

- Total costs for the first two years - \$21,365 to \$36,055 per patient
 - PTSD treatment – first two years: \$5,904 to \$10,298 per patient
 - Treatment for related depression - \$15,461 to \$25,757 per patient
- Over a 50 year period, the cost is \$1,443,500 per patient

Traditional treatment is on-going and costly

* All data is based on the RAND study of returning veterans

IV. Costs – Traditional treatment

Indirect costs

Indirect costs*

- Effect on employment – (14.1% unemployed veterans vs. 7.3% for non-veteran peers)
- Effect on homelessness:
 - Over 50% of veterans with Head injury/TBI are homeless
 - Veterans make up 8% of the population, and 23% of homeless persons
- Impact on lost taxes revenue

Entitlement costs to Texas (per year)

- \$60,000 per Veteran
- \$3.1 billion in total

Indirect costs are very high

* All data is based on the RAND study of returning veterans and State of Texas study

IV. Costs – Returns

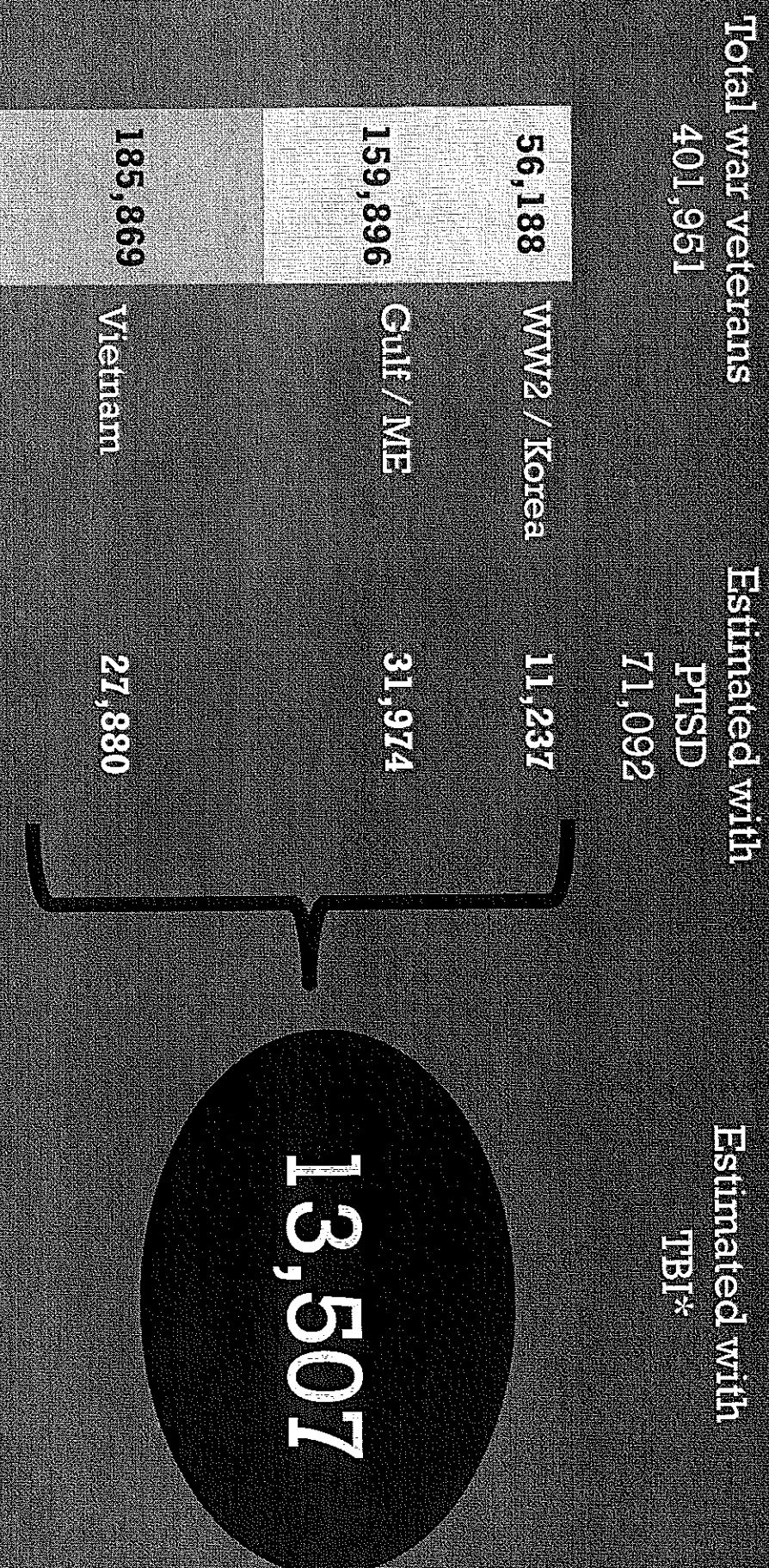
- Direct cost avoidance using HBOT treatment per patient per year \$14,355*
- HBOT treatment is a one time cost. Traditional treatment costs recur annually – total savings much larger

HBOT treatment is 2.87 more cost effective than traditional treatment in the first year only**

*Assumes mid point of savings from prior pages

**Assumes no additional depression related treatment and \$5,000 for HBOT

IV. Costs – AZ veterans



* Assumes 19% of PTSD have TBI. Official number is 1,050 based on VA definition of TBI

IV. Costs – AZ costs

Estimated annual treatment costs*

Direct

\$193.8

Million

Indirect

\$810.4

Million

* Based on average direct costs of \$14,355 and \$60,000 indirect – from prior pages

V. Options in AZ – Two possible

1. Fund a *Public Sector* “Patriot clinic” similar to that in Oklahoma
2. Treat patients at *Private Facilities* (public – private partnership)

V. Options – Public Sector clinic

Financial*

| ITEM | ONE SHIFT | THREE SHIFTS (24/7) |
|--|-----------|------------------------|
| Capital expenditure | \$370,800 | \$370,800 |
| Operating Expense per month | \$45,215 | \$154,150 |
| Operating expense per patient (40 sessions) | \$2,512 | \$1,941 |

Private facilities – No capital expenditure

* Using Tucson based variables

V. Options – Two suitable facilities in AZ

Two 6-chamber private facilities
(approximate current volumes)

| Facility | Available Hours per year* | Pt.-hrs. per year** | Total patients per year*** |
|---|---------------------------------|------------------------|----------------------------------|
| NorthStar Neurology (Tucson) | 2,470 | 4,940 | 124 |
| Dr. Reach (Phoenix) | 2,470 | 6,587 | 165 |

*5 days per week, 10 hrs. per day, two weeks vacations and holidays

**Total hours, 1.5 hours per patient (incl. turnaround), 5 patients per session

***40 sessions per patient

V. Options – Cost at private facilities

Approximate current costs

| Facility | Cost per session | Cost per patient (40 sessions) |
|------------------------------------|------------------|--------------------------------|
| NorthStar Neurology (Tucson) | \$63 | \$2,512 |
| Dr. Reach (Phoenix) | \$115 | \$4,600 |

Medicare reimbursement is \$315 per session

V. Options – Capacity in private facilities

Private facilities capacity
(approximate annual patient volume)

| Facility | 7 days per week at current level | Two shifts | Three shifts |
|------------------------------------|-------------------------------------|------------|--------------|
| NorthStar Neurology (Tucson) | 288 | 471 | 691 |
| Dr. Reach (Phoenix) | 288 | 471 | 691 |
| TOTAL | 576 | 942 | 1,382 |

Private facilities can be used for “proof of concept”

VI. Oklahoma- Patriot clinics

**The Oklahoma
Veteran Traumatic
Brain Injury
Treatment and
Recovery Act
Is NOW Law!
June 19th, 2014**



VI. Oklahoma - Experience to-date

Volumes since opening:

- 400 patients – 200 veterans
- 11,000 sessions

Charity funded



DR. WILLIAM A. DUNCAN

VII. Next steps



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TBI in Special Forces Veterans Challenges

Carol L. Henricks, M.D.
NorthStar Hyperbaric/NorthStar Neurology, PC
Tucson, AZ

 **NorthStar Hyperbaric
NorthStar Neurology, PC**
Everything Happens in Neurorehabilitation

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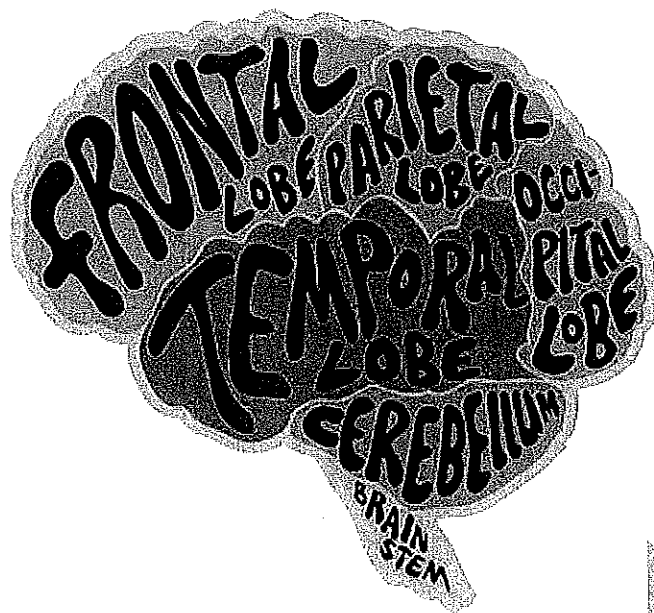
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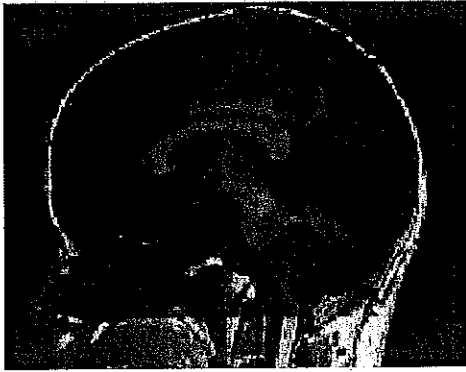
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A collection of symptoms does not make a diagnosis, it just tells you where to look in the body for the source of the problem. Problems with thinking, vision, emotions, fatigue, sleep and coordination come from brain problems.



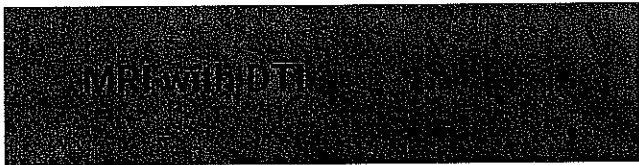


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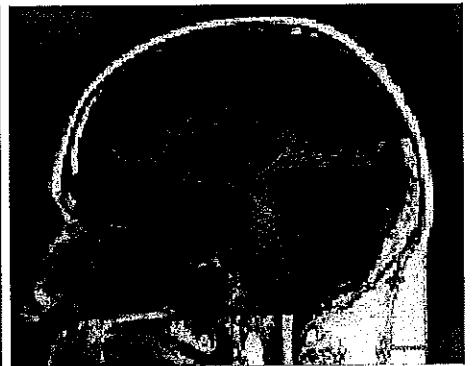


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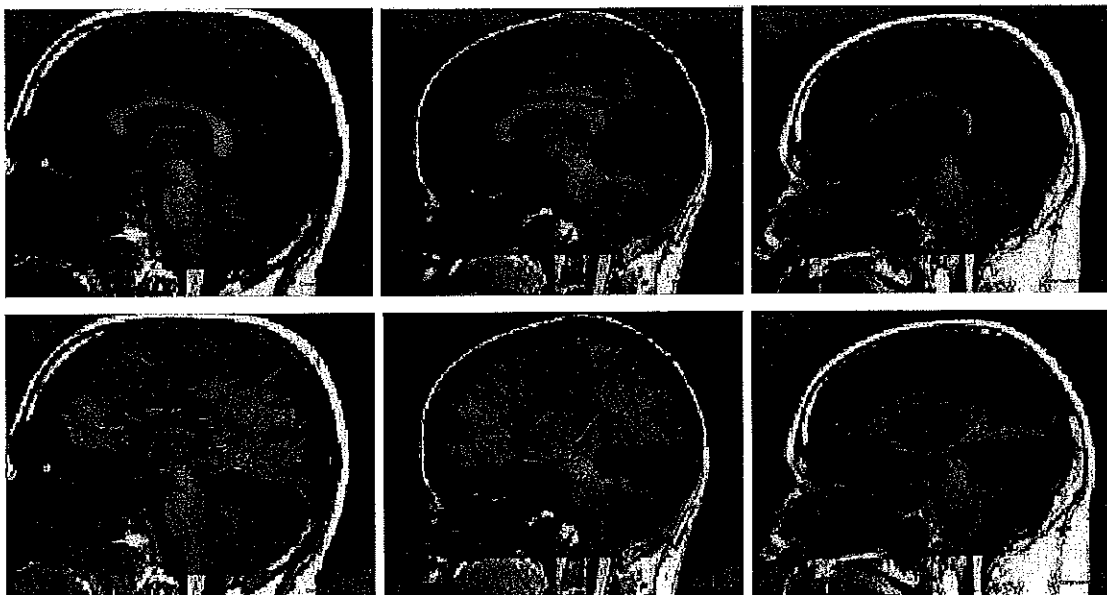
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Perspective



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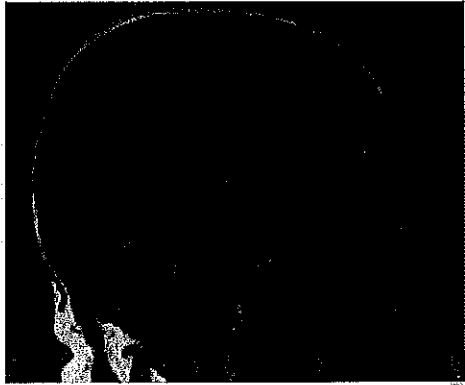


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Loss of brain function due to sleep apnea or repeated compression

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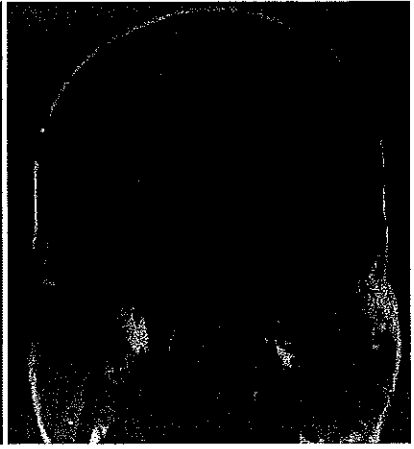
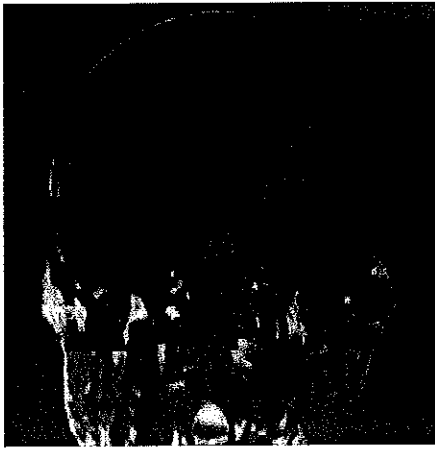
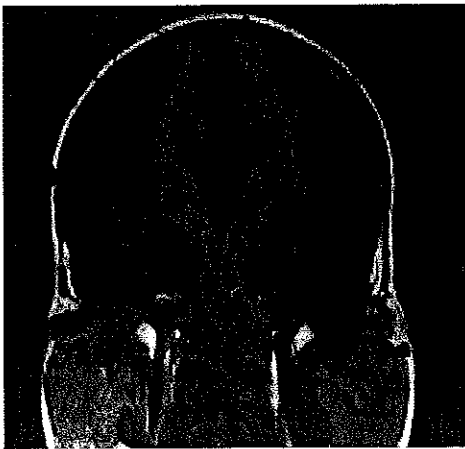
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Loss of brain connections and weakness are
due to repetitive concussion



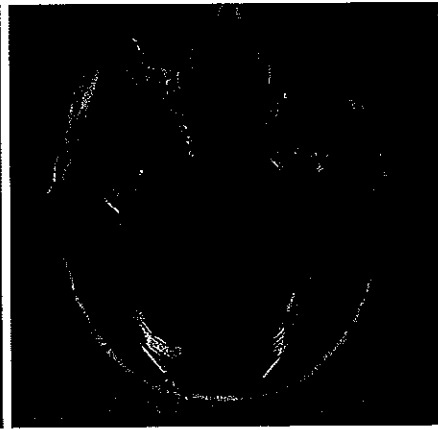
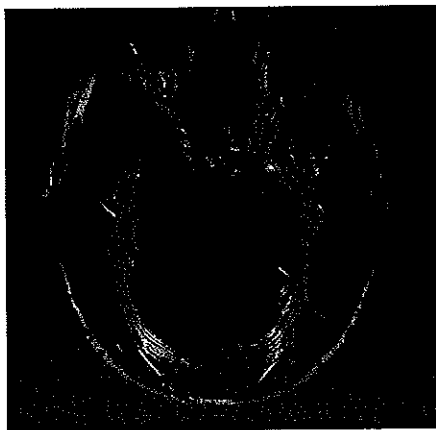
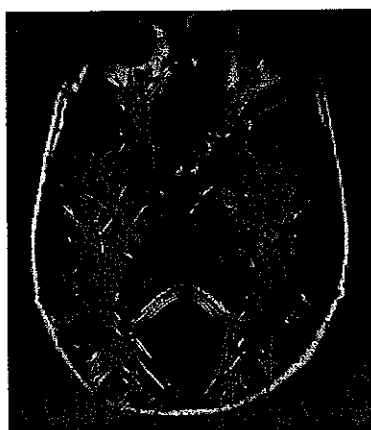
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Loss of brain mechanism for visual information
processing due to head injury or stroke



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Dr. Carl Dennis Treanor, MD
Neurologist, Director of the
NorthStar Hyperbaric Clinic, about 100
hours of training.

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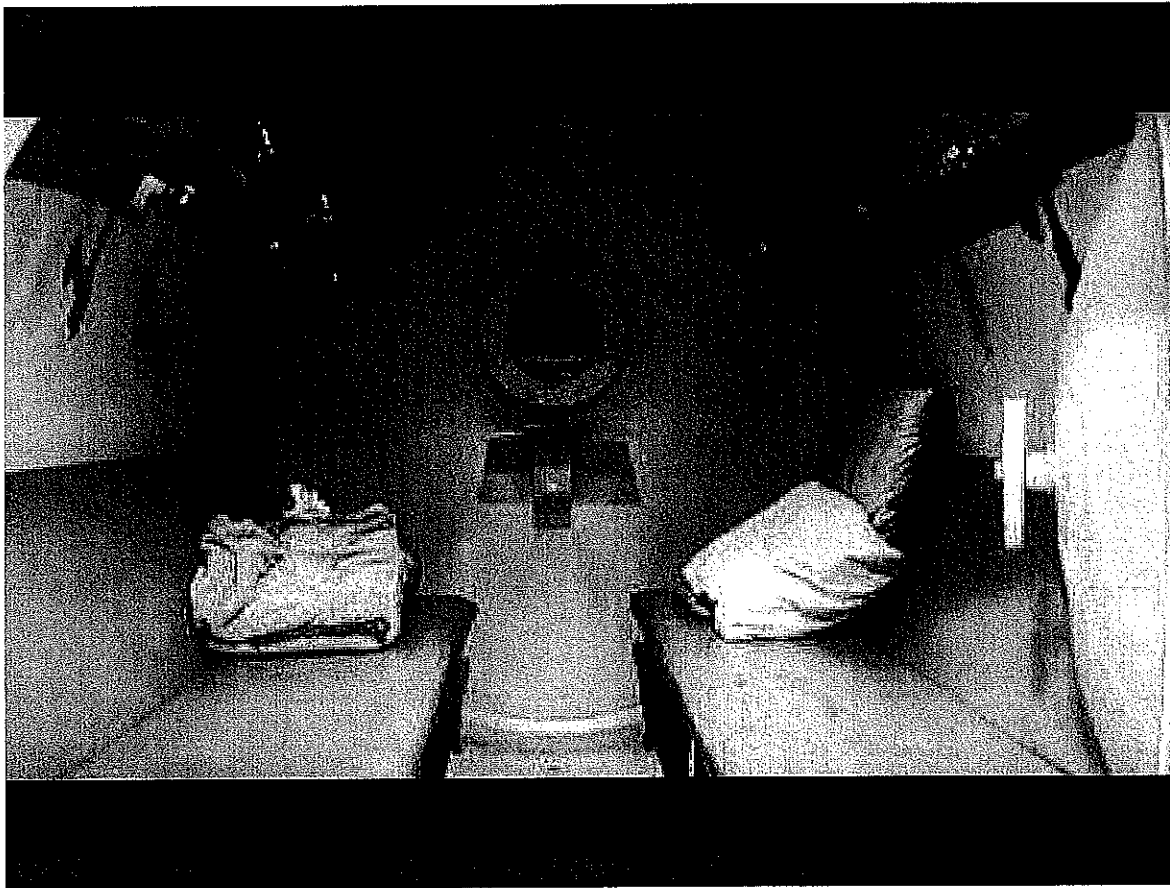
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Army Ranger Veteran

- 2003 - 2008 Active Duty
- 10 Deployments

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Chris Libby
Staff Sergeant, United States Army

Service:

- 27 Dec 1997 - 28 Dec 2001: Marines
- 1 Oct 2002 - 29 Oct 2012: Army

Deployments:

- Feb 2003 - Feb 2004: Iraq (multi blasts minor)
- Feb 2005 - Dec 2006: Iraq (multi blasts minor)
- Feb 2008 - May 2009: Afghanistan (multi blasts major/1 nearly fatal)

Injuries:

- TBI
- PTSD
- Neck and back injuries
- Carpal tunnel syndrome
- Left arm stretch injury with nerve damage

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CHRIS

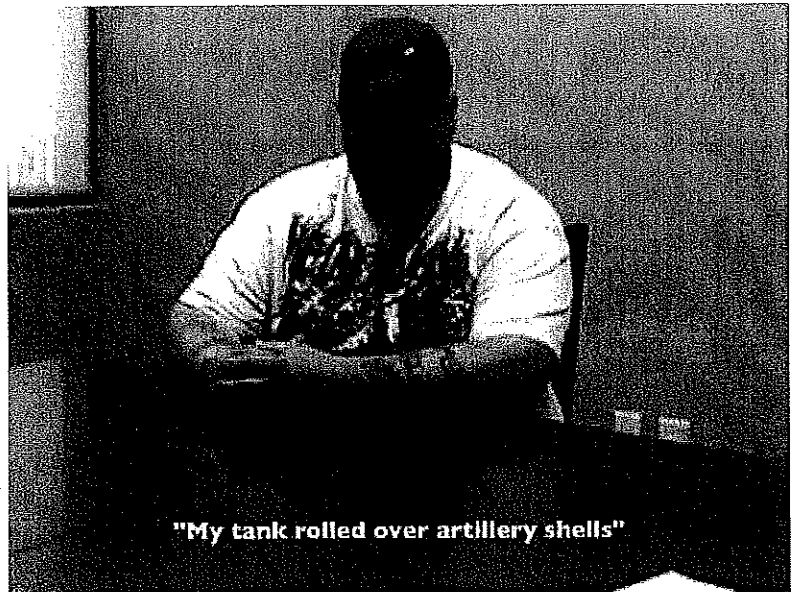




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Shayne
Army Veteran
Multiple Deployments

2003



"My tank rolled over artillery shells"

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Robin W. O'Barron
Technical Sergeant (Retired)
United States Air Force



- 1987-2005, 18 years of service
- Deployment: August 1990-March 1991
King Abdul Aziz Air Base, Dhahran, Kingdom of Saudi Arabia Operations Desert Shield and Desert Storm
- TDY September - December 1992
King Abdul Aziz Air Base, Dhahran Riyadh Air Base, Kingdom of Saudi Arabia Operation Southern

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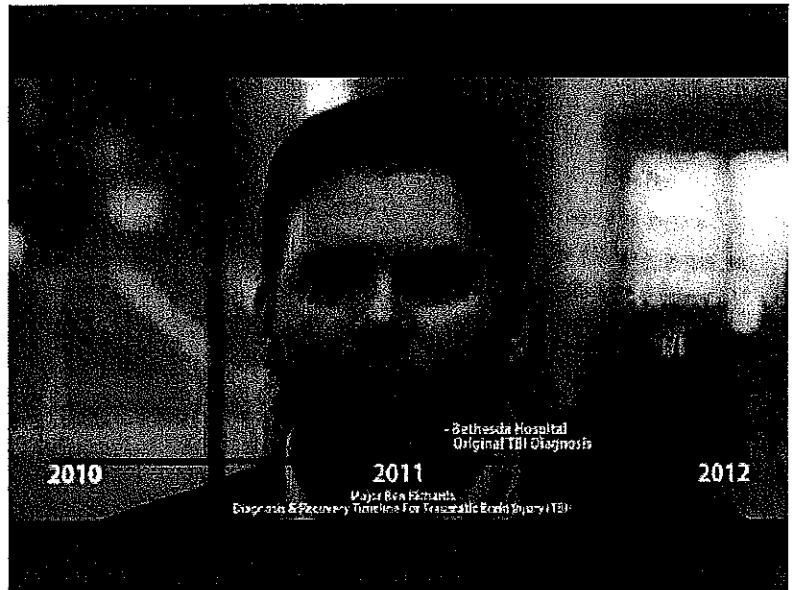




PATRIOT CLINIC GRASSROOTS MOVEMENT

Major Ben Richards: A Soldier's
Story of Combat and
Homecoming

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Everything 110% In Neurorehabilitation

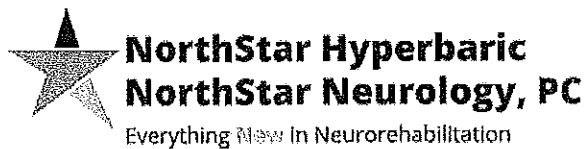
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NorthStar HBOT thanks:

Thank you **26 Point 2 Designs** for all of your design work, creating presentations and the newsletter.

Thank you **Garrett Moldrem** for creating videos for this project.

Thank you **Shannon Zawada** and **SimonMed** for producing the MRI - DTI images.



northstarhbot.com



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Learn more about the work of Patriot Clinics and how you can make a donation.

Your donation will give life saving help to a veteran and is greatly appreciated.

**Visit www.patriotclinics.com and click on
the "Donate Now" link.**

10:02A CONVENED
11:27A ADJOURNED

ARIZONA STATE LEGISLATURE
Fifty-second Legislature - Second Regular Session

INTERIM COMMITTEE ROLL CALL VOTE

COMMITTEE: House Ad Hoc Committee on Treatment of Traumatic Brain Injuries

DATE: November 3, 2016 MOTION: _____

CHAIRMAN Mark Finchem VICE-CHAIRMAN _____

| | PASS | AYE | NAY | PRESENT | ABSENT |
|------------------------|------|-----|-----|---------|--------|
| Saad Allawi | | | | ✓ | |
| Dr. Levi Bolton | | | | ✓ | |
| Jay Lawrence | | | | ✓ | |
| Dr. Georg Hishaw | | | | | ✓ |
| Dr. Eric Meyer | | | | ✓ | |
| Chief Kara/Mark Angle | | | | ✓ | |
| Dr. Gary Smith | | | | | ✓ |
| Mark Finchem, Chairman | | | | ✓ | |
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APPROVED:

R. Padilla

COMMITTEE SECRETARY

COMMITTEE CHAIRMAN

ATT/ Attachment 5